



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/589,747

08/17/2006

Kenjiro Higaki

AI-419NP

9831

23995

7590

03/06/2009

RABIN & Berdo, PC

1101 14TH STREET, NW

SUITE 500

WASHINGTON, DC 20005

EXAMINER

CHIU, TSZ K

ART UNIT

PAPER NUMBER

2822

MAIL DATE

DELIVERY MODE

03/06/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,747	Applicant(s) HIGAKI ET AL.	
	Examiner Tsz K. Chiu	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☒ Claim(s) 5-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/17/06, 8/10/07, 9/8/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-19 are rejected under 35 U.S.C. 112, second paragraph, it is unclear if these claims are independent (the preamble is not the same as those claims as recited in the body of these claims) or dependent. Furthermore, it is unclear whether or not all of the limitations of the claims recited in the body of these claims are incorporated into the independent or dependent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki (5882949) in view of Akram et al. (6114240) further in view of Ikeda et al. (5928768).

With respect to claim 1, Okazaki discloses a through-hole (11, For example Fig. 2a) formed at least one of a predetermined position within respective regions defined as the insulative members (17, For example Fig. 2a), and a position across a boundary between the each region and a region outside the region, however, Okazaki fail to

Art Unit: 2822

disclose a collective substrate made of a ceramic and the insulative members as extending thicknesswise of the insulative member, wherein the through-hole has a single minimum size hole portion located at a position thicknesswise of the insulative member, and an interior surface tapered such that an opening size progressively decreases from openings of the through-hole in the main surface and in the external connection surface toward the minimum size hole portion.

Akram disclose insulative member as extending thicknesswise of the insulative member , wherein the through-hole has a single minimum size hole portion located at a position thicknesswise of the insulative member, and an interior surface tapered such that an opening size progressively decreases from openings of the through-hole in the main surface and in the external connection surface toward the minimum size hole portion.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use the extending thicknesswise for the purpose of improved method for fabricating semiconductor components with small, closely spaced contacts.

Kabushiki disclose the use of the ceramic substrate (column1, lines 34-40).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use the ceramic material for the purpose of improving the heat radiation characteristics and mechanical strength and heat cycle resistance characteristics are improved for the reason of a countermeasure to prevent

Art Unit: 2822

clamping cracks formed in the assembly step of the circuit board or cracks formed by adding a heat cycle.

. With respect to claim 2, Okazaki and Akram discloses invention set forth to claim 1 however Okazaki and Akram fail to disclose the substrate is made from ceramic material having a heat conductivity of not less than 10 W/mK.

Kabushiki discloses substrate is made from ceramic material having a heat conductivity of not less than 10 W/mK (column 1, lines 11-15).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use the ceramic material for the purpose of improve a circuit board, thereby making it possible to form a thin circuit board, and with the maximum deflection and anti-breaking strength of the circuit board are considerably improved in comparison with a conventional circuit board.

With respect to claim 3, Okazaki and Akram discloses invention set forth to claim 1 however Okazaki and Akram fail to disclose the substrate is made from ceramic material having a thermal expansion coefficient of not more than $10 \times 10^{-6}/\text{degree. C.}$

Kabushiki discloses substrate is made from ceramic material having a thermal expansion coefficient of not more than $10 \times 10^{-6}/\text{degree. C}$ (column 1, lines 34-40 “a ceramic substrate such as an alumina (Al_2O_3)” in applicant’s specification stated that a Al_2O_3 have a thermal expansion coefficient of 4×10^{-6} to $7 \times 10^{-6}/\text{degree. C.}$).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use the ceramic material for the purpose of improve a circuit board, thereby making it possible to form a thin circuit board, and with the maximum deflection and anti-breaking strength of the circuit board are considerably improved in comparison with a conventional circuit board.

With respect to claim 4, Okazaki disclose forming the through holes in the substrate (11, For example Fig. 2a), however Okazaki did not discloses produced by firing a planar precursor sheet as a material for the collective substrate and then forming through-holes in the resulting substrate.

However, according to the MPEP, Section 2113, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process".

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsz K. Chiu whose telephone number is 571-272-8656. The examiner can normally be reached on 0800 to 1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. Wilczewski/
Primary Examiner, Art Unit 2822

TC
March 1, 2009